CLAIMS

1. A modulation semiconductor integrated circuit device which controls a voltage-controlled oscillation circuit with a first control voltage to produce a base frequency signal, controls the voltage-controlled oscillation circuit with a second control voltage which is derived from data to be transmitted thereby to implement the frequency modulation, and implements the data transmission by changing the base frequency, wherein a circuit of producing the second control voltage has its reference current value controlled in response to the change of the base frequency such that the variation of the second control voltage of the voltage-controlled oscillation circuit in response to the change of base frequency exhibits a characteristic that is opposite to the characteristic of modulation frequency deviation of the voltage-controlled oscillation circuit.

2. A modulation semiconductor integrated circuit device according to claim 1 including a phase comparison circuit which compares in phase the oscillation output of said voltage-controlled oscillation circuit with a reference clock signal, and a control voltage generation circuit which generates, in accordance with the phase difference detected by said phase comparison circuit, such a voltage that the phase difference dissolves and applies as the first control voltage to said voltage-controlled oscillation circuit, said voltage-

controlled oscillation circuit, said phase comparison circuit, and said control voltage generation circuit forming in unison a phase-locked loop.

3. A modulation semiconductor integrated circuit device according to claim 2, wherein said second control voltage is supplied to said voltage-controlled oscillation circuit through a path separate from the path of said phase-locked loop.

4. A modulation semiconductor integrated circuit device according to any of claim 1 through claim 3, wherein said circuit of producing the second control voltage includes a digital filter which samples a digital transmission data signal and implements a computation for the sampled signal, and a D/A conversion circuit which implements the D/A conversion for the output of said digital filter, said controlled reference current value being the reference current value of said D/A conversion circuit.

5. A modulation semiconductor integrated circuit device according to any of claim 1 through claim 4, wherein said phase-locked loop includes a variable counter circuit which counts the oscillation output of said oscillation circuit, and a register which sets a value to be counted by said variable counter circuit, the base frequency being changed in response to the alteration of the value set in said register, the reference current value being controlled in accordance with the value set in said register.

6. A modulation semiconductor integrated circuit device according to any of claim 1 through claim 5 including a trimming circuit which adjusts the reference current value.

7. A modulation semiconductor integrated circuit device according to any of claim 1 through claim 6, wherein said voltage-controlled oscillation circuit includes a first variable capacitance means and a second variable capacitance means, and has its oscillation frequency varied in response to the variation in capacitance value of said first variable capacitance means by the first control voltage and in response to the variation in capacitance value of said second variable capacitance means by the second control voltage.

8. A modulation semiconductor integrated circuit device according to claim 5, wherein the count result of said variable counter circuit is accessible by read-out from the outside through an external terminal.

9. A modulation semiconductor integrated circuit device according to claim 8, wherein the count result of said variable counter circuit is accessible by read-out from the outside through an external terminal via said register and the register setting path.

10. A method of testing a semiconductor integrated circuit device which includes a voltage-controlled oscillation circuit having its oscillation frequency controlled by a first control voltage and a second control voltage individually, a

phase comparison circuit which compares in phase the oscillation output of said voltage-controlled oscillation circuit with a reference clock signal, and a control voltage generation circuit which generates, in accordance with the phase difference detected by said phase comparison circuit, such a voltage that the phase difference dissolves and applies as the first control voltage to said voltage-controlled oscillation circuit, with said voltage-controlled oscillation circuit, said voltage-controlled oscillation circuit, said phase comparison circuit and said control voltage generation circuit being connected to form a phase-locked loop, said second control voltage being supplied to said voltage-controlled oscillation circuit through a path separate from the path of said phase-locked loop,

wherein said method activates said oscillation circuit for the test operation by applying the second control voltage which is made higher than the voltage for the normal operation, counts the output of said oscillation circuit with a counter, and tests the variation of the output frequency of said oscillation circuit caused by the second control voltage by making reference to the count value in a predetermined duration of said counter.